

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

## **INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In accordance with the provisions of 37 C.F.R. § 1.56, Applicants request that citation and examination of the references identified on the attached Form PTO-1449, required copies of which are enclosed herewith in accordance with 37 C.F.R. §1.98, be made during the course of examination of the above-referenced application for United States Letters Patent.

Since this Information Disclosure Statement is being submitted after the mailing of the first Office Action, payment of the fee set forth in 37C.F.R. §1.17(p) accompanies this submission.

- Payment by credit card.

Respectfully submitted,

  
Jonathan P. Taylor, Ph.D.  
Registration No. 48 338

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600 West Jackson  
Suite 625  
Chicago, IL 60661  
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**INFORMATION DISCLOSURE CITATION**  
(Use several sheets if necessary)First Named Inventor:  
Jian-Ku ShangFiling Date:  
March 10, 2004Group:  
1774**U.S. PATENT DOCUMENTS**

Examiner Initials*		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
Z1		2,670,334	02/1954	D'Allio			
Z2		3,373,104	03/1968	Ryan			
Z3		3,395,970	08/1968	Machell			
Z4		3,520,806	07/1970	Ryan			
Z5		3,542,582	11/1970	Degginger			
Z6		3,676,173	07/1972	Adams			
Z8		3,853,721	12/1974	Darlington et al.			
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Z10		3,971,669	07/1976	Wiresien et al.			
Z11		4,045,338	08/1977	Miyamoto et al.			
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Z13		4,125,486	11/1978	Uzumaki et al.			
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Z15		4,256,607	03/1981	Yoshida et al.			
Z16		4,265,768	05/1981	Beasley et al.			
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Z19		4,313,832	02/1982	Shimizu et al.			
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Z21		4,362,646	12/1982	Ikegami et al.			
Z22		4,476,191	10/1984	Girgis			

Examiner	Date Considered
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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Examiner Initials*		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	Z23	4,513,032	04/1985	Klinkowski			
	Z24	4,544,499	10/1985	Tran et al.			
	Z25	4,550,015	10/1985	Korb et al.			
	Z26	4,569,756	02/1986	Klein			
	Z27	4,693,828	09/1987	Yoshioka et al.			
	Z28	4,693,828	09/1987	Yoshioka et al.			
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	Z43	5,212,144	05/1993	Schwartz, Jr.			
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Z45		5,276,000	01/1994	Matthews et al.			
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	Z67	5,707,471	01/1998	Petrak et al.			
	Z68	5,710,092	01/1998	Baker			
	Z69	5,759,942	06/1998	Tan et al.			
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							Yes	No
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	Y3	0 036 584 A2	09/1981	EP				X
	Y4	0 045 824 A1	02/1982	EP				

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Examiner Initials*		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
	Y5	0 285 321 A2	10/1988	EP				
	Y6	0 608 539 A1	08/1994	EP				
	Y7	0 630 685 A1	12/1994	EP				X
	Y8	0 608 539 A1	08/1994	EP				
	Y11	1 415 853	11/1975	GB				
	Y13	WO 01/97973	12/2001	WO				
	Y14	WO 98/34723	08/1998	WO				
	Y15	WO 99/61384	12/1999	WO				
	Y18	WO 2005/087679	09/2005	WO				
	Y19	JP 58 0044039 A	04/1981	Japan				Abstract

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Include, as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages

X1	"Ion Exchange", Kirk-Othmer Encyclopedia of Chemical Technology, 3 <sup>rd</sup> Ed., vol. 13, pp. 685-689 and 694, 1981.
X2	Abstract for "Carborundum Process Converts Pitch into Non-Flammable Fiber", Industrial Research vol. IR-100, Circle 231, 1 page, 1972.
X3	Ahmadipour, et al., "The Preparation of Active Carbons from Coal by Chemical And Physical Activation", Carbon, vol. 34, No. 4, pp. 471-479, 1996.
X4	Andreopoulos, et al., "Thermally Activated Phenolic Fibers", Chemistry of Materials, vol. 3, No. 4, pp. 594-597, 1991.
X5	Ayles, "Phenolic", Modern Plastics Encyclopedia Handbook, pp. 78-80, 1994.
X7	Carrott, et al., "Preparation of activated carbon 'membranes' by physical and chemical activation of cork", Carbon, vol. 37, pp. 515-517, 1999.
X9	Dimotakis, et al., "Water Vapor Adsorption on Chemically Treated Activated Carbon Cloths", Chemistry of Materials, vol. 7, pp. 2269-2272, 1995.
X10	Dominguez, et al., "Design of High Efficiency Polymeric Cation Exchange Fibers", Polym. Adv. Technol. 12, pp.197-205, 2001.
X11	"Ion Exchangers", Dorfner, editor, pp. 28-45 and 206-285, 1990.
X12	Economy, et al., "Adsorption Characteristics of Activated Carbon Fibers", Applied Polymer Symposium No. 29, 198-211, 1976.

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		OTHER ITEMS – NON PATENT LITERATURE DOCUMENTS Include, as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages
X14	Economy, et al., "Tailoring Carbon Fibers for Adsorbing Volatiles", Chemtech, pp. 597-603, 1992.	
X15	Economy, "Now that's an interesting way to make a fiber!", Chemtech, vol. 10, pp. 240-247, 1980.	
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X18	Ermanlenko, et al., "Chemically Modified Carbon Fibers and Their Applications", VCH Publishers, pp. 59-73, 1990.	
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X21	Grynszpan, et al., "Synthesis and reactions of large-ring spirodienone calixarene derivatives", Pure & Appl. Chem., Vol. 68, No. 6, pp. 1249-1254, 1996.	
X24	Jagtoyen, et al., "Some Considerations of the Origins of Porosity in Carbons from Chemically Activated Wood", Carbon, vol. 31, No. 7, pp. 1185-1192, 1993.	
X26	Kunin, "Six Decades of Ion Exchange Technology at Rohm and Haas", Chemical Heritage 17:2, pp. 8, 9, 36-38, 1999.	
X27	Lee, et al., "Vapor adsorption on coal-and wood-based chemically activated carbons (II) adsorption of organic vapors", Carbon, vol. 37, pp. 15-20, 1999.	
X28	Lin, et al., "Extraction of Gold from Au(III) Ion Containing Solution by a Reactive Fiber", Journal of Applied Polymer Science, vol. 49, pp. 1635-1638, 1993.	
X29	Lin, et al., "Studies of the Preparation, Structure, and Properties of an Acrylic Chelating Fiber Containing Amidoxima Groups", Journal of Applied Polymer Science, vol. 47, pp. 45-52, 1993.	
X30	Lin, et al., "The Preparation and Properties of Activated Carbon Fibers Derived from Phenolic Precursor", Applied Polymer Symposium, No. 21, pp. 143-152, 1973.	
X32	Liu, et al., "Surfactant-Directed Synthesis of Nanoporous Thiol-Functionalized Organic-Inorganic Hybrid Fibers for Highly Selective Removal of Mercury", Polymeric Materials: Science & Engineering, 91, pp. 1037-1038, 2004.	
X33	Liu, et al., "Novel Polymeric Chelating Fibers for Selective Removal of Mercury and Cesium from Water", Environmental Science and Technology, vol. 37, No. 18, pp. 4261-4268, 2003.	
X34	"Glass fibers chelate heavy metals", Chemical & Engineering News, Vol. 81, No. 37, P. 21, 2003.	
X35	Liu, et al., "Hybrid Mesoporous Materials with Functionalized Monolayers", Chem. Eng. Technol., 21, pp. 97-100, 1998.	
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X39	Molina-Sabio, et al., "Porosity in Granular Carbons Activated with Phosphoric Acid", Carbon, vol. 33, No. 8, pp. 1105-1113, 1995.	

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OTHER ITEMS – NON PATENT LITERATURE DOCUMENTS Include, as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages		
	X41	Odian, Principles of Polymerization, Third Edition John Wiley & Sons, pp. 125-132, 1991.
	X43	Rodriguez, "Table 15.11 Aldehyde condensation products", Principles of Polymer Systems, Fourth Edition, p. 638, 1996.
	X45	Search Report for Patent Cooperation Treaty application No. PCT/US 01/41081, 7 pages, Date of Mailing Nov. 9, 2001.
	X46	Search Report for Patent Cooperation Treaty application No. PCT/US 01/19952, 8 pages, Date of Mailing Nov. 14, 2001.
	X47	Search Report for Patent Cooperation Treaty application No. PCT/US 01/19946, 8 pages, Date of Mailing Nov. 14, 2001.
	X48	Solum, et al., "Evolution of Carbon Structure in Chemically Activated Wood", Carbon, vol. 33, No. 9, pp. 1247-1254, 1995.
	X50	Tolas, et al., "Production of Activated Carbons from a Washington Lignite Using Phosphoric Acid Activation", Carbon, vol. 34, No. 11, pp. 1419-1426, 1996.
	X51	Molina-Sabio, et al., "Influence of the atmosphere used in the carbonization of phosphoric acid impregnated peach stones", Carbon, vol. 33, no. 8, pp.1180-1182, 1995.

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